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For

A HAND-HELD CONTAINER

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A HAND-HELD CONTAINER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Priority is claimed from United States Provisional Patent Application No. 60/438,864, filed on January 8, 2003, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

1). Field of the Invention

[0002] This invention relates to a hand-held container of the kind that can be used for containing and dispensing milk or other beverages, condiments, medicines, and cosmetics.

2). Discussion of Related Art

[0003] Milk and other liquids are usually sold in a container having a removable cap. Such a cap is often awkward and frustrating to remove and replace, especially when the container is already held in one hand and a person's other hand is not available. Some of these containers have push-on caps that, at least conceivably, can be popped off by applying pressure to the container, but that would cause spilling of the liquid.

SUMMARY OF THE INVENTION

[0004] The invention provides a hand-held container for a liquid, which includes a main body having an internal volume for holding the liquid, a burstable member located over and peripherally sealing with an outlet out of the main body so that the burstable member and the main body jointly retain the liquid within the internal volume, bursting of the burstable member allowing the liquid through the outlet of the main body, and a guide on a side of the burstable member opposing the main body, the liquid flowing through the guide after flowing through the outlet.

[0005] The burstable member may be made of a thin plastics material such as saran that can burst without the need for it to form a weakness.

[0006] The burstable member may alternatively be a membrane of a stronger material such as aluminum which at least partially forms a weakness along which the membrane can tear to allow the liquid out of the internal volume.

[0007] Preferably, two adjacent portions of the membrane form the weakness, so that the adjacent portions separate along the weakness.

[0008] The membrane may have at least three weaknesses, so that the membrane has at least three portions that separate from one another.

[0009] The weaknesses may meet at a junction at or near a center of the membrane.

[0010] The main body may be made of a flexible material that can be deformed

in a squeezing action to pressurize the liquid, pressure of the liquid causing tearing of the membrane.

[0011] The main body may be made of a flexible material in a region of the outlet to allow for deformation of the outlet, deformation of the outlet causing tearing of the membrane.

[0012] The guide may be a spout secured to the main body through which the liquid flows after flowing through the outlet.

[0013] The spout preferably surrounds the liquid.

[0014] The hand-held container may, in addition to the burstable member, include a retaining component which defines an enclosed volume together with the spout, the retaining component being removable to allow for the liquid to flow out of the spout.

[0015] The invention also provides a hand-held container which includes a main body capable of holding a liquid within an internal volume thereof and having an aperture, and a membrane located over and peripherally sealing with the aperture, so that the membrane together with the main body retain liquid within the internal volume, the membrane at least partially forming a weakness along which the membrane can tear to allow the liquid out of the internal volume.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0016] The invention is further described by way of example with reference to the accompanying drawings, wherein:
- [0017] Figure 1 is a cross-sectional side view of a hand-held container according to an embodiment of the invention;
- [0018] Figure 2 is an end view of the container;
- [0019] Figure 3 is an end view of a burstable membrane forming part of the container; and
- [0020] Figure 4 is a view similar to Figure 3, illustrating one manner of breaking the membrane.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Figures 1 and 2 of the accompanying drawings illustrate a hand-held container 10, according to an embodiment of the invention, which includes a main body 12, a spout 14, a burstable membrane 16, and a retaining plug 18. The main body 12 and the spout 14 are integrally formed in a molding process, and the burstable membrane 16 is typically formed in the same molding process. Another alternative is to have the membrane 16 made from a sheet of thinner material than the main body 12 and subsequently welding or fusing the membrane to the main body 12 utilizing a heated or rotating plunger. The retaining plug 18 is subsequently located on the spout 14. The spout 14 could also be welded to the main body 12 in a separate stage of manufacture, either before or after filling of the main body with a liquid. Welding can be accomplished with a heated or rotating plunger, sonic welding, induction welding, etc.

[0022] The main body 12 has a length 20 and a diameter 22. The diameter 22 is typically about 0.75 inches, and the length may, for example, be about 2.2 inches. The main body 12 has a wall 24 having a thickness of approximately 0.5 mm, and is made of a flexible plastics material. The wall 24 defines an internal volume 26.

[0023] The main body 12 has an outlet 28. The outlet 28 has a diameter of approximately 0.25 inches, or perhaps up to 0.5 inches. There are no outlets out of the main body other than the outlet 28.

[0024] Figure 3 illustrates the membrane 16 in more detail. The membrane 16 has an outer edge 32 that seals peripherally with a ring 34. The ring 34 is circumferentially fused with the outlet 28. Six weaknesses 38 are formed in the membrane 16. The weaknesses 38 meet at a center of the membrane 16. The weaknesses 38 divide the membrane 16 into six contiguous portions 40.

[0025] Referring again to Figure 1, the spout 14 is located on a side of the membrane 16 opposing the main body 12. The spout 14 tapers to a small opening 42 in an end thereof. The retaining plug 18 is located in the opening 42 so that the spout 14, the membrane 16, and the retaining plug 18 jointly define an enclosed volume 44.

[0026] In use, the internal volume 26 is filled with a liquid 48. The liquid may, for example, be milk or another beverage, a condiment, a medicine, or a cosmetic. The internal volume 26 is typically filled with the liquid 48 before final molding of the main body 12 is completed. As such, the internal volume 26 can be filled with the liquid 48 and air be vented from the internal volume 26, whereafter the main body 12 is finally molded so that the liquid 48 is held within the internal volume 26. The base (on the right in Figure 1) may, for example, be left open and the main body 12 may be filled with the base at the top, whereafter the base can be crimped closed, similar to a tube of toothpaste. The liquid 48 is then prevented from leaving the internal volume 26, jointly by the main body 12 and the membrane 16. Alternatively, the main body 12 may be filled through the

outlet 28 with a liquid, whereafter the membrane 16 is welded onto the main body 12.

[0027] What should be noted is that there is little or no gas trapped within the internal volume 26. Liquid expands more slowly with temperature than gas, and a large pocket of gas will unduly pressurize the internal volume 26 at increased temperature and cause undesired bursting of the membrane 16. The main body 12 may be shaped and be made of a material that will accommodate small increases in volume due to expansion. Gas, on the other hand, is more compressible than liquid. Compressibility of the gas can be used to compensate for undesired squeezing, for example during transportation.

[0028] A person may squeeze the main body 12 in order to burst the membrane 16. Squeezing of the main body 12 increases the pressure within the internal volume 26, which causes an increase in pressure on one side of the membrane 16. The membrane 16 then breaks along one or more of the weaknesses 38, which allows the liquid 48 to flow through the outlet 28 into the enclosed volume 44. The retaining plug 18 may be removed before squeezing of the main body 12, or may be removed by the liquid that flows into and pressurizes the enclosed volume 44. The liquid is entirely surrounded by the spout 14, and is guided by the spout 14 out of the opening 42.

[0029] In the embodiment where the membrane 16 has weaknesses formed therein, the membrane 16 is typically made of a material such as aluminum. It

may also be possible to make the membrane of a thin plastics material such as polyethylene, polystyrene, saran, etc., that will burst without the need for weaknesses.

[0030] Figure 4 illustrates another way of breaking the membrane 16, instead of by squeezing the main body 12. According to the method illustrated in Figure 4, an opposing force 50 is applied to the ring 34. The opposing force 50 may, for example, be applied by squeezing the ring 34 between a thumb and a forefinger. The ring 34 deforms from a circular shape into an oval shape, which causes breaking of the membrane 16 along one or more of the weaknesses 38.

[0031] Another system may use an “active” component to release the fluid. For example, a sharp component may puncture the membrane. Such a component may, for example, be activated by squeezing the main container.

[0032] It can thus be seen that the membrane 16 provides a speedy and convenient system for releasing the liquid 48 from the internal volume 26, especially because of the possibility for one-handed operation. Although the liquid 38 is easily dispensed, the spout 14 still guides and directs the liquid to control the flow thereof out of the container 10.

[0033] Although a specific embodiment is described, it should be understood that variations are possible without departing from the scope and spread of the invention. It may, for example, be possible to have a membrane that bursts at its periphery. It may also be possible to have a burstable or pop-out plug instead of

a burstable membrane. As will be appreciated, it may also be possible to have a channel-shaped guide instead of a spout that entirely surrounds the liquid.

[0034] While certain exemplary embodiments have been described and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative and not restrictive of the current invention, and that this invention is not restricted to the specific constructions and arrangements shown and described since modifications may occur to those ordinarily skilled in the art.